

HAZARD CONTROL PLAN AND WORK AUTHORIZATION Page 1 of 3

This form is from ESH-17-035

1. Describe the work to be performed (use continuation page if needed) or give procedure number, revision number, and title.

HCP-ESH-17-Wind Tunnel, R1

Title: Operation of the Wind Tunnel

A wind tunnel is used to verify operation of stack flow measurement instrumentation. See page 3 for general operating instructions.

HCP covers normal operations only, not operations involved with relocating the wind tunnel.

2. Describe potential hazards associated with the work (use continuation page if needed).

Noise: When running, the wind tunnel produces some noise, but much less since the intake and exhaust were routed outside. Noise levels are well below levels that require hearing protection. For long exposure, hearing protection is a good idea.

Cuts/Scrapes/Pinch: Parts of the wind tunnel can have rough edges; handling instrumentation and hand tools can result in nicks/cuts/bruises.

Rotating Machinery: The wind tunnel is equipped with a fan, behind a belt guard and cage.

3. For each hazard, list the likelihood and severity, and the resulting initial risk level (before any work controls are applied, as determined according to LIR300-00-01.0, section 7.2)

Noise: Occasional / Moderate = Low

Cuts/Scrapes/Pinch: Occasional / Moderate = Low

Rotating Machinery: Improbable / Critical = Low

Overall *initial* risk: ☐ Minimal ☒ Low ☐ Medium ☐ High

4. Applicable Laboratory, facility, or activity operational requirements directly related to the work:

☒ None ☐ List:

Work Permits required? ☒ No ☐ List:

5. Describe how the hazards listed above will be mitigated (e.g., safety equipment, administrative controls, etc.):

Noise: following wind tunnel installation at TA-35 Bldg 34, noise analysis was conducted by ESH-5 or Industrial Hygienist. According to analysis, no hearing protection is required.

Cuts/Scrapes/Pinch: Use care and common sense, and work in a calm, unhurried fashion.

Rotating Machinery: Do not operate fan without protective guard/cage installed

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6. Knowledge, skills, abilities, and training necessary to safely perform this work (check one or both):



Group-level orientation (per ESH-17-032) and training to applicable procedure.



Other → Describe:

Obtain instruction on use from someone familiar with operation.

Skill-of-craft work for Eberline Environmental workers. NOTE: this plan covers only MAQ employees.

7. Any wastes and/or residual materials? (check one) ☒ None ☐ List:8. Considering the administrative and engineering controls to be used, the *residual* risk level (as determined according to LIR300-00-01.0, section 7.3.3) is (check one):

Minimal



Low



Medium (requires approval by Division Director)

9. Emergency actions to take in event of control failures or abnormal operation (check one):



None



List:

Call 911 for all emergencies at the Laboratory

After this form is approved, perform the work safely. Identify opportunities for improvements in safety and report these to the safety officer or group leader.

Preparer(s) signature(s)

Name(s) (print) /Position

Date

[NOTE: Training to a procedure constitutes authorization.] **If this work is NOT described by a procedure:** I have reviewed the safety of this proposed work with the group safety officer and I commit to follow safe practices when performing this work.

Employee signature

Name (print)

Date

Additional employee signature (optional)

Name (print)

Date

Additional employee signature (optional)

Name (print)

Date

Group leader or safety officer review.

I have reviewed the proposed work with 1) the preparer(s) and 2) employees who will perform the work (if not described in a procedure) and I believe the hazards and safety concerns have been adequately addressed. The work as described above is hereby authorized. This authorization expires one year after the date below.

Group leader or safety officer signature

Name (print)

Date

This plan will be revised according to ESH-17-035. Group leader or safety officer: After completion, submit to ESH-17 Records Coord.

HAZARD CONTROL PLAN AND WORK AUTHORIZATION**Hazard Control Plan continuation page. Give item number being continued.****1. General procedure for using wind tunnel:****a) Stack flow instrument verification**

The wind tunnel is used after a day of stack measurements (mandatory), and before a day's measurements if desired. This measurement verifies performance of the electronic digital manometer (EDM) used in the stack flow measurement.

The wind tunnel has a permanently installed pitot tube, and a dedicated inclined manometer to measure velocity pressures. Both of these instruments are primary standards for flow velocity measurements.

Turn on the fan, and adjust the dial to a velocity near the stack velocity measured that day. A total of three measurements must be taken, at velocities approximating the stack flow measured that day. For example, if the stack velocity measurement is 2000 feet per minute (fpm), verification measurements could be taken at 1500, 2000, and 2500 fpm.

Once the velocity is set, connect the EDM used in that day's flow measurements to the pitot tube, in parallel with the incline manometer. When readings stabilize, compare the two instruments. The values should be within 5% to pass the verification test. Repeat this measurement at all required velocity levels.

b) Wind tunnel performance test

When the EDM is recently returned from the calibration laboratory, performance test the wind tunnel and pitot tube by measuring the tunnel's flow rate with the fan on its maximum setting. Compare the measured value with the historical value for this fan and tunnel configuration. Investigate and resolve any differences.